NATURAL RESOURCES CONSERVATION SERVICE

CONSERVATION PRACTICE STANDARD

FILTER STRIP

(Acre)

CODE 393

DEFINITION

A strip or area of herbaceous vegetation situated between cropland, grazing land, or disturbed land (including forestland) and environmentally sensitive areas

PURPOSE

- To reduce sediment, particulate organics, and sediment adsorbed contaminants in run-off.
- To reduce dissolved contaminants in run-off.
- To restore or maintain sheet flow of run-off during the establishment of riparian forest buffers.
- To reduce sediment, particulate organics, and sediment adsorbed contaminants in surface irrigation tailwater.
- To enhance habitat for wildlife and beneficial insects.
- To serve as setback zones to minimize the potential for direct introduction of contaminants into wells and surface water inlets that would convey water directly into groundwater and surface water systems.

CONDITIONS WHERE PRACTICE APPLIES

This practice applies in areas situated between cropland, grazing land, or disturbed land where sediment, particulate organic matter, and/or dissolved contaminants may leave the contributing land and enter environmentally sensitive areas. This practice applies only when planned in conjunction with other conservation practices as component to a conservation management system and where run-off water interacts with the planned vegetation.

CRITERIA

General Criteria Applicable to All Purposes

Filter strips shall be designated as vegetated areas to treat runoff and are not part of the adjacent cropland rotation, grazing land, or disturbed land.

Filter strip location requirements:

- The filter strip shall be located along the downslope edge of a field or disturbed area. To the extent practical, it shall be placed on the approximate contour. Variation in placement on the contour should not exceed an average of 0.5 percent longitudinal (perpendicular to the flow length) gradient.
- The drainage area above the filter strip shall have greater than 0.5 percent slopes.

The average annual sheet and rill erosion rate above the filter strip shall be less than ten tons per acre per year. Erosion rates will be estimated using the Revised Universal Soil Loss Equation (RUSLE).

Overland flow entering the filter strip shall be sheet flow. Concentrated flow shall not be allowed to enter the filter strip. Structural water management practices may need to be installed to eliminate concentrated flow and/or reduce the size of the contributing area.

To maintain sheet flow into the filter strip, the contributing area will not have a slope length exceeding:

Slope	Slope Length
1-3 percent	300 feet
3-6 percent	200 feet
Greater than 6 percent	100 feet

Slope length is the horizontal distance from the origin of overland flow to a point of deposition or concentrated flow.

The minimum design flow length will be computed as a 3:1 ratio of contributing area to filter strip flow length (i.e., 300 feet contributing area slope length = 100 feet filter strip flow length). The filter flow length may be adjusted to improve farm system operations as long as the minimum design flow length is maintained. The filter flow length will be at least 30 feet but not more than 120 feet.

When applied to watershed flood control structures, maintain an effective filtering zone by establishing the previously described design filter flow length above a design storm elevation equal to a 10-year, 24-hour frequency storm for the drainage area of the structure. The filter flow length shall also continue from the design storm elevation to the crest of inlet of the structure. The maximum flow length then will be the design filter flow length, plus the distance between the design storm elevation to the crest of inlet of the structure.

Filter strips will not be installed on unstable channel banks.

State listed noxious weeds will not be established in the filter strip and will be controlled if present.

Filter strip establishment shall comply with local, state, and federal regulations.

The filter strip shall be established to permanent herbaceous vegetation consisting of a single species or a mixture of grasses, legumes, and/or other forbs adapted to the soil and climate and nutrients, chemicals, and practices used in the current management system. Species selected shall have stiff stems and a high stem density near the ground surface.

Additional Criteria to Reduce Dissolved Contaminants in Run-off

Selected vegetative species will be compatible or tolerant to the contaminant of concern from the field.

Fields or disturbed areas contributing run-off to the filter strip shall be planned utilizing management practices that reduce the potential losses of contaminants: Conservation Practice Standards 590, Nutrient Management; 595, Pest Management; and/or 633, Waste Utilization.

Sheet and rill erosion shall not exceed tolerable level (T) established for the predominant soil map units present.

Additional Criteria to Reduce Sediment, Particulate Organics, and Sediment Adsorbed Contaminants in Surface Irrigation Tailwater

Filter strip vegetation may be a small grain or other suitable annual with a plant spacing that does not exceed four inches. Planting will not be conducted parallel to direction of water flow.

Filter strips shall be established early enough prior to the irrigation season so that the vegetation can withstand sediment deposition from the first irrigation.

Additional Criteria to Enhance Habitat for Wildlife and Beneficial Insects

This purpose is intended to be used in combination with one or more of the previous purposes, and the minimum criteria for the previous purpose(s) must be met.

Any addition to the flow length for wildlife or beneficial insects shall be added to the downhill slope of the filter strip.

Vegetation to enhance wildlife may be added to that portion of the filter strip devoted to other purposes to the extent they do not detract from its primary functions.

Plant species selected for this purpose shall be for permanent vegetation adapted to the wildlife or beneficial insect population(s) targeted. Plant species selected will be

compatible/tolerant with the primary functions of the filter strip.

Filter strip width and length shall be based on requirements of the targeted wildlife or insects. Density of the vegetative stand established for this purpose shall consider targeted wildlife habitat requirements and encourage plant diversity.

Once established, the filter strip shall not be mowed during the established nesting season of the target wildlife.

Livestock and vehicular traffic in the filter strip shall be excluded during the nesting season of the target species and during the vegetation establishment period.

Additional Criteria to Serve As Setback Zones to Minimize the Potential for Direct Introduction of Contaminants Into Wells and Surface Water Inlets That Convey Water Directly Into Groundwater and Surface Water Systems

- Flow length will be a minimum of 30 feet from the well head or surface water inlet unless otherwise determined by product labels, local, state, or federal regulations.
- For atrazine-containing products, flow length will be a minimum of 50 feet from all wells, including abandoned wells, drainage wells, and sinkholes for ***mixing, loading, or application areas***. When designing as a filter between ***mixing and loading areas*** and any intermittent stream, river, or natural or impounded reservoir, the minimum flow length will also be 50 feet.
- ***For application areas***, the minimum flow length will be 66 feet at points where field run-off enters perennial or intermittent streams or rivers.
- The minimum design flow length will be 200 feet when adjacent to natural or impounded lakes or reservoirs where atrazine-containing products are ***being applied***. Farm ponds are exempt if the water is not used for drinking water, and if the location is wholly on the owner's property and the discharge is not conveyed directly to a perennial or intermittent stream or river.
- Plant species selected will be compatible with the contaminants of concern. Plants should consist of stiff stemmed upright varieties that will reduce run-off velocities, cause deposition, and increase soil infiltration.

CONSIDERATIONS

Filter strips should be strategically located to reduce run-off and increase infiltration and ground water recharge throughout the watershed.

Use vegetation that is somewhat tolerant to herbicides used in the upslope crop rotation to minimize the chance of damage.

Consider using this practice to enhance the conservation of declining species of wildlife, including those that are threatened or endangered.

Consider using this practice to protect National Register listed or eligible (significant) archaeological and traditional cultural properties from potential damaging contaminants.

Filter strip size should be adjusted to a greater flow length to accommodate harvest and maintenance equipment.

Consider plant selections that will perform intended functions, be compatible with farming operations, and have product utility in the farming unit.

Avoid utilizing plant species considered invasive to on-site or off-site plant communities.

This practice may adversely affect cultural resources and should comply with General Manual, Title 420, Part 401.

PLANS AND SPECIFICATIONS

Based on this standard, plans and specifications shall be prepared for each specific field site where a filter strip will be installed. A plan includes information about the location, construction sequence, vegetation establishment, and management and maintenance requirements.

Specifications will include:

- Length, width, and slope of the filter strip to accomplish the planned purpose (length refers to flow length across the filter strip).
- Species selection and seeding or sprigging rates to accomplish the planned purpose.
- Planting dates and care and handling of the seed to ensure that planted materials have an optimal rate of survival.
- A statement that only viable, high quality, and regionally adapted seed will be used.
- Site preparation sufficient to establish and grow selected species.

OPERATION AND MAINTENANCE

For the purposes of filtering contaminants, permanent filter strip vegetative plantings should be harvested as appropriate to encourage dense growth, maintain an upright growth habit, and remove nutrients and other contaminants that are contained in the plant tissue.

Control undesired weed species, including state-listed noxious weeds. Methods will be used that do not endanger the adjacent environmentally sensitive area.

Prescribed burning may be used to manage and maintain the filter strip. Timing of prescribed burns can impact the effectiveness of filter strips. Prescribed burns should only be used if needed to enhance the growth of grasses and/or to control weeds.Inspect the filter strip after storm events and repair any gullies that have formed, remove unevenly deposited debris and sediment accumulation that will disrupt sheet flow, re-seed disturbed areas, and take other measures to prevent concentrated flow through the filter strip.

Apply supplemental nutrients as needed to maintain the desired species composition and stand density of the filter strip.

To maintain or restore the filter strip's function, periodically regrade the filter strip area when sediment deposition at the filter strip-field interface jeopardizes its function, and then reestablish the filter strip vegetation, if needed. Sediments removed will be placed in upland areas outside the high water mark of environmentally sensitive area.

If wildlife habitat is a purpose, regrading only those areas needed to remove sediment and fill concentrated flow paths should minimize destruction of the vegetation.

Grazing shall not be permitted in the filter strip unless a controlled grazing system is being implemented. Grazing will be permitted under a controlled grazing system only when soil moisture conditions support livestock traffic without excessive compaction.

Caution must be observed when tilling equipment with, or spraying herbicides next to, the vegetative filter strip in order to prevent damage to vegetation and maintain the designed flow length.